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### UNIVERSITY AND EDUCATIONAL NEWS

By the will of Mrs. E. D. Denning, of Norwood, London, who left an estate of the gross value of £167,719, there is bequeathed "to the Public Trustee all her freehold property in trust for a 'Frank Denning Memorial' for the advancement and propagation of education in mechanical science in any part of the United Kingdom, with preference to those persons who reside in the Borough of Croydon."

ENGLISH exchanges report that Lord Lovat, Mr. Otto Beit and Mr. Rudyard Kipling have accepted the positions of trustees under the will of the late Mr. Cecil Rhodes in succession to Lord Rosebery and Sir Lewis Mitchell, who resigned recently, and of the late Earl Grey, who had resigned shortly before his death. The trustees have decided to allot the four new scholarships created in substitution for the scholarships formerly held by Germans to the provinces of Alberta and Saskatchewan, to the Transvaal, to the Orange Free State and alternately to the towns of Kimberley and Port Elizabeth in the Cape Province. As Alberta and Saskatchewan have hitherto had one scholarship between them, the effect of this decision will be that each of these provinces will now have a scholarship. The trustees have decided not to make any appointments to any scholarships this year, either in the United States or in any part of the British empire, although the qualifying examinations in the United States will be held as already arranged. This decision is based upon the fact that as all candidates must be men of military age it would not be in accordance with the spirit of the testator's design if young men who first responded to the call of patriotism were to be penalized for having done so. Any candidate who is eligible this year will be equally qualified for election next year.

No successor to the late Professor Wm. Bullock Clark will be appointed at the Johns Hopkins University. The geological department has been reorganized on a committee basis with Professor Edward Bennett Mathews as chairman and Associate Professor J. T. Singewald, Jr., as secretary. The instruction formerly given by Professor Clark has been divided

among the geological faculty, Professor Edward W. Berry taking his work in paleontology and historical geology.

At Pennsylvania State College, David Allen Anderson has been chosen professor of education and head of the department of education and psychology. Dr. Anderson was previously associate professor of education in the University of Washington.

PROFESSOR GEORGE B. MCNAIR is acting head of the department of electrical engineering of Colorado College during the absence of Professor George B. Thomas.

DR. WILLIAM SHINER, superintendent of the pathological laboratory of the Indiana State Board of Health, has been offered the professorship of pathology in the University of Texas.

DR. SAMUEL A. MATTHEWS, professor of physiology and experimental pharmacology in the University of Kansas, Topeka and Lawrence, has accepted the similar chair in the University of Alabama, Mobile.

DR. FRANCIS M. VAN TUYL, formerly instructor of geology in the University of Illinois, has recently been appointed an assistant professor in the Colorado School of Mines, at Golden.

BERNARD A. CHANDLER, of the Vermont Agricultural Experiment Station, has been appointed assistant professor of forest utilization in the department of forestry of Cornell University.

W. G. BRIERLEY, chairman of the division of horticulture, department of agriculture, University of Minnesota, has been promoted to the rank of associate professor.

DR. FLORENCE PEEBLES, professor of biology at Newcomb College, Tulane University, has been appointed associate professor of physiology at Bryn Mawr College.

DR. J. LUCIEN MORRIS, formerly associate in biological chemistry at the Washington University Medical School, has accepted the position of associate in physiological chemistry at the college of medicine, University of Illinois.

A CHAIR of tuberculosis has been instituted by the Edinburgh University Court, and Sir

Robert Philip has been appointed as the first professor of the subject.

#### DISCUSSION AND CORRESPONDENCE ISOLATION CULTURES WITH SMALL AQUARIA

WHEN raising small forms of vegetable or animal aquatics, it is sometimes desirable to follow the development of several individuals simultaneously, and for some considerable time. This can be done of course by removing the specimens to separate small aquaria, but by so doing the temperature and other conditions are likely to offer a considerable range of variation among the different specimens. This invites uncertainty as to the natural rate of development, or in response to any intended variable introduced by the experimenter. The desirable condition is to combine a considerable volume of water with isolation of individuals so that each specimen may have essentially identical conditions of temperature, and concentration as each other, in groups of eight to twelve individuals.

During a study of *Lemna* carried on for several months, it was desired to isolate individual plants in order to watch the rate of growth. As the frond floats freely, some method by which the surface of the water could be enclosed in distinct areas seemed likely to meet conditions. It was found that common cotton cord, waxed with paraffine, and tied into loops two inches in diameter, were excellent for this work so long as the water was undisturbed. Any disturbance, however, either accidental or in course of the work, by which the upper surface of the string loops become wet, made these sink quickly after they had been in use two or three days, and the enclosed specimens would then be confused with any others which might be near. Small snails developing in pond water used were quite a source of loss of specimens by their destructive habits, as well as factors of uncertainty, through the displacement of the string loops, drawn below the surface by the movement of the snails in case these crawled across the strands. The vessels used at this time were common glass battery jars, and served very well in keeping

the plants in good condition, but they were unnecessarily deep.

Later work was done with large crystallizing dishes, and the separation of individuals was secured by the use of glass dehydrating dishes with short legs and perforated bottoms, for inside dishes. This was found very satisfactory. The volume of water in the crystallizing dish was large enough to retain a much more steady temperature than did the small separate dishes tried for a time, and the perforated walls of the enclosing inner dishes permitted the movement of the water with sufficient freedom to eliminate any variable concentration or composition.

In securing single specimens for the isolation work, some interesting conditions were encountered on account of the toughness of the water film. It was found difficult, for example, to lift a single specimen of *Lemna* or *Wolffia* because the surface film would drag several additional specimens along with the desired individual. This trouble was largely eliminated by giving a smart puff of breath close to the desired specimen, which would cause a general scattering of all the floating particles from that point. As the elasticity of the film was released upon the cessation of the blowing, the dispersed specimens were drawn inward toward the center of the cleared area. On account of size, root development or other causes, the different specimens did not move with equal speed, and any one of the specimens first entering the cleared space could be lifted and removed with ease. It was found that a lance-head needle was an excellent lifter for the specimens.

Of three species under observation, *Wolffia* was the easiest to thus isolate, *Lemna paucicostata* next, and *Spirodella* the most difficult to lift with certainty. This is because *Wolffia* is completely immersed in the slight amount of water adhering to the needle, and sticks closely as this is raised from the dish. The single root of *Lemna*, and the many roots of *Spirodella*, prevent the fronds of these plants from so closely adhering to the flat needle, and their added weight also is adverse. It was found further that a dry needle was far